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Reviewer: Anne Corrigan

Timestamp: [year=2009; month=9; day=4; hr=9; min=32; sec=24; ms=78;]

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Application No: 10582549 Version No: 1.1

Input Set:

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Started: 2009-09-04 09:25:13.911

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Elapsed: 0 hr(s) 0 min(s) 0 sec(s) 421 ms

Total Warnings: 0

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No. of SeqIDs Defined: 4

Actual SeqID Count: 4

SUBSTITUTE SEQUENCE LISTING

<110> The Regents of the University of Michigan

<120> Geraniol Synthase, Method of Production and Uses Thereof

<130> 2115-002692

<140> 10582549

<141> 2009-08-21

<150> PCT/US2004/040321

<151> 2004-12-02

<160> 4

<170> PatentIn version 3.5

<210> 1

<211> 1704

<212> DNA

<213> Ocimum basilicum

<300>

<301> Iijima,Y., Gang,D.R., Lewinsohn,E. and Pichersky,E.

<302> Characterization of geraniol synthase from the peltate glands of sweet basil

<303> Plant Physiol.

<304> 134

<305> 1

<306> 370-379

<307> 2004

<308> AY362553

<309> 2004-08-05

<313> (1)..(1704)

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 <213> Ocimum basilicum

<400> 2

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			20					25					30		

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Lys	Leu	Ile	Asp	Asn	Ile	Gln	Gln	Leu	Gly	Ile	Gly	Tyr	Tyr	Phe	Glu	100	105	110	
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Asp	Leu	Phe	Thr	Ala	Ala	Leu	Arg	Phe	Arg	Leu	Leu	Arg	His	Asn	Gly	130	135	140	
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Ser	Asn	Leu	Gly	Val	Ala	Gly	Glu	Glu	Ile	Leu	Glu	Glu	Ala	Met	Glu	180	185	190	
Phe	Ala	Glu	Ala	Arg	Leu	Arg	Arg	Ser	Leu	Ser	Glu	Pro	Ala	Ala	Pro	195	200	205	
Leu	His	Gly	Glu	Val	Ala	Gln	Ala	Leu	Asp	Val	Pro	Arg	His	Leu	Arg	210	215	220	
Met	Ala	Arg	Leu	Glu	Ala	Arg	Arg	Phe	Ile	Glu	Gln	Tyr	Gly	Lys	Gln	225	230	235	240
Ser	Asp	His	Asp	Gly	Asp	Leu	Leu	Glu	Leu	Ala	Ile	Leu	Asp	Tyr	Asn	245	250	255	

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260 265 270

Trp Lys Glu Leu Gly Leu Val Asp Lys Leu Ser Phe Gly Arg Asp Arg
275 280 285

Pro Leu Glu Cys Phe Leu Trp Thr Val Gly Leu Leu Pro Glu Pro Lys
290 295 300

Tyr Ser Ser Val Arg Ile Glu Leu Ala Lys Ala Ile Ser Ile Leu Leu
305 310 315 320

Val Ile Asp Asp Ile Phe Asp Thr Tyr Gly Glu Met Asp Asp Leu Ile
325 330 335

Leu Phe Thr Asp Ala Ile Arg Arg Trp Asp Leu Glu Ala Met Glu Gly
340 345 350

Leu Pro Glu Tyr Met Lys Ile Cys Tyr Met Ala Leu Tyr Asn Thr Thr
355 360 365

Asn Glu Val Cys Tyr Lys Val Leu Arg Asp Thr Gly Arg Ile Val Leu
370 375 380

Leu Asn Leu Lys Ser Thr Trp Ile Asp Met Ile Glu Gly Phe Met Glu
385 390 395 400

Glu Ala Lys Trp Phe Asn Gly Gly Ser Ala Pro Lys Leu Glu Glu Tyr
405 410 415

Ile Glu Asn Gly Val Ser Thr Ala Gly Ala Tyr Met Ala Phe Ala His
420 425 430

Ile Phe Phe Leu Ile Gly Glu Gly Val Thr His Gln Asn Ser Gln Leu
435 440 445

Phe Thr Gln Lys Pro Tyr Pro Lys Val Phe Ser Ala Ala Gly Arg Ile
450 455 460

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465 470 475 480

Gly Asp Leu Ala Ser Cys Val Gln Leu Phe Met Lys Glu Lys Ser Leu

485

490

495

Thr Glu Glu Glu Ala Arg Ser Arg Ile Leu Glu Glu Ile Lys Gly Leu
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Trp Arg Asp Leu Asn Gly Glu Leu Val Tyr Asn Lys Asn Leu Pro Leu
515 520 525

Ser Ile Ile Lys Val Ala Leu Asn Met Ala Arg Ala Ser Gln Val Val
530 535 540

Tyr Lys His Asp Gln Asp Thr Tyr Phe Ser Ser Val Asp Asn Tyr Val
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Asp Ala Leu Phe Phe Thr Gln
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<213> Salvia officinalis

<400> 3

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35 40 45

Met Gly Asn Glu Ile Gln Thr Gly Arg Arg Thr Gly Gly Tyr Gln Pro
50 55 60

Thr Leu Trp Asp Phe Ser Thr Ile Gln Leu Phe Asp Ser Glu Tyr Lys
65 70 75 80

Glu Glu Lys His Leu Met Arg Ala Ala Gly Met Ile Ala Gln Val Asn
85 90 95

Met Leu Leu Gln Glu Glu Val Asp Ser Ile Gln Arg Leu Glu Leu Ile
100 105 110

Asp Asp Leu Arg Arg Leu Gly Ile Ser Cys His Phe Asp Arg Glu Ile		
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Ser Asp Leu Tyr Ser Thr Ala Leu Arg Phe Lys Leu Leu Arg Gln Tyr		
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Asp Phe Ser Val Ser Gln Glu Val Phe Asp Cys Phe Lys Asn Asp Lys		
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Gly Thr Asp Phe Lys Pro Ser Leu Val Asp Asp Thr Arg Gly Leu Leu		
180	185	190
Gln Leu Tyr Glu Ala Ser Phe Leu Ser Ala Gln Gly Glu Glu Thr Leu		
195	200	205
His Leu Ala Arg Asp Phe Ala Thr Lys Phe Leu His Lys Arg Val Leu		
210	215	220
Val Asp Lys Asp Ile Asn Leu Leu Ser Ser Ile Glu Arg Ala Leu Glu		
225	230	235 240
Leu Pro Thr His Trp Arg Val Gln Met Pro Asn Ala Arg Ser Phe Ile		
245	250	255
Asp Ala Tyr Lys Arg Arg Pro Asp Met Asn Pro Thr Val Leu Glu Leu		
260	265	270
Ala Lys Leu Asp Phe Asn Met Val Gln Ala Gln Phe Gln Gln Glu Leu		
275	280	285
Lys Glu Ala Ser Arg Trp Trp Asn Ser Thr Gly Leu Val His Glu Leu		
290	295	300
Pro Phe Val Arg Asp Arg Ile Val Glu Cys Tyr Tyr Trp Thr Thr Gly		
305	310	315 320
Val Val Glu Arg Arg Glu His Gly Tyr Glu Arg Ile Met Leu Thr Lys		
325	330	335

Ile Asn Ala Leu Val Thr Thr Ile Asp Asp Val Phe Asp Ile Tyr Gly
340 345 350

Thr Leu Glu Glu Leu Gln Leu Phe Thr Thr Ala Ile Gln Arg Trp Asp
355 360 365

Ile Glu Ser Met Lys Gln Leu Pro Pro Tyr Met Gln Ile Cys Tyr Leu
370 375 380

Ala Leu Phe Asn Phe Val Asn Glu Met Ala Tyr Asp Thr Leu Arg Asp
385 390 395 400

Lys Gly Phe Asn Ser Thr Pro Tyr Leu Arg Lys Ala Trp Val Asp Leu
405 410 415

Val Glu Ser Tyr Leu Ile Glu Ala Lys Trp Tyr Tyr Met Gly His Lys
420 425 430

Pro Ser Leu Glu Glu Tyr Met Lys Asn Ser Trp Ile Ser Ile Gly Gly
435 440 445

Ile Pro Ile Leu Ser His Leu Phe Phe Arg Leu Thr Asp Ser Ile Glu
450 455 460

Glu Glu Asp Ala Glu Ser Met His Lys Tyr His Asp Ile Val Arg Ala
465 470 475 480

Ser Cys Thr Ile Leu Arg Leu Ala Asp Asp Met Gly Thr Ser Leu Asp
485 490 495

Glu Val Glu Arg Gly Asp Val Pro Lys Ser Val Gln Cys Tyr Met Asn
500 505 510

Glu Lys Asn Ala Ser Glu Glu Glu Ala Arg Glu His Val Arg Ser Leu
515 520 525

Ile Asp Gln Thr Trp Lys Met Met Asn Lys Glu Met Met Thr Ser Ser
530 535 540

Phe Ser Lys Tyr Phe Val Gln Val Ser Ala Asn Leu Ala Arg Met Ala
545 550 555 560

Gln Trp Ile Tyr Gln His Glu Ser Asp Gly Phe Gly Met Gln His Ser

565

570

575

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<210> 4

<211> 599

<212> PRT

<213> *Mentha spicata*

<400> 4

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Leu Leu Ser Ser Thr Asn Ser Ser Ser Arg Ser Arg Leu Arg Val Tyr
 35 40 45

Cys Ser Ser Ser Gln Leu Thr Thr Glu Arg Arg Ser Gly Asn Tyr Asn
 50 55 60

Pro Ser Arg Trp Asp Val Asn Phe Ile Gln Ser Leu Leu Ser Asp Tyr
 65 70 75 80

Lys Glu Asp Lys His Val Ile Arg Ala Ser Glu Leu Val Thr Leu Val
 85 90 95

Lys Met Glu Leu Glu Lys Glu Thr Asp Gln Ile Arg Gln Leu Glu Leu
 100 105 110

Ile Asp Asp Leu Gln Arg Met Gly Leu Ser Asp His Phe Gln Asn Glu
 115 120 125

Phe Lys Glu Ile Leu Ser Ser Ile Tyr Leu Asp His His Tyr Tyr Lys
 130 135 140

Asn Pro Phe Pro Lys Glu Glu Arg Asp Leu Tyr Ser Thr Ser Leu Ala
 145 150 155 160

Phe Arg Leu Leu Arg Glu His Gly Phe Gln Val Ala Gln Glu Val Phe
 165 170 175

Asp Ser Phe Lys Asn Glu Glu Gly Glu Phe Lys Glu Ser Leu Ser Asp		
180	185	190
Asp Thr Arg Gly Leu Leu Gln Leu Tyr Glu Ala Ser Phe Leu Leu Thr		
195	200	205
Glu Gly Glu Thr Thr Leu Glu Ser Ala Arg Glu Phe Ala Thr Lys Phe		
210	215	220
Leu Glu Glu Lys Val Asn Glu Gly Gly Val Asp Gly Asp Leu Leu Thr		
225	230	235 240
Arg Ile Ala Tyr Ser Leu Asp Ile Pro Leu His Trp Arg Ile Lys Arg		
245	250	255
Pro Asn Ala Pro Val Trp Ile Glu Trp Tyr Arg Lys Arg Pro Asp Met		
260	265	270
Asn Pro Val Val Leu Glu Leu Ala Ile Leu Asp Leu Asn Ile Val Gln		
275	280	285
Ala Gln Phe Gln Glu Glu Leu Lys Glu Ser Phe Arg Trp Trp Arg Asn		
290	295	300
Thr Gly Phe Val Glu Lys Leu Pro Phe Ala Arg Asp Arg Leu Val Glu		
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Cys Tyr Phe Trp Asn Thr Gly Ile Ile Glu Pro Arg Gln His Ala Ser		
325	330	335
Ala Arg Ile Met Met Gly Lys Val Asn Ala Leu Ile Thr Val Ile Asp		
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Asp Ile Tyr Asp Val Tyr Gly Thr Leu Glu Glu Leu Glu Gln Phe Thr		
355	360	365
Asp Leu Ile Arg Arg Trp Asp Ile Asn Ser Ile Asp Gln Leu Pro Asp		
370	375	380
Tyr Met Gln Leu Cys Phe Leu Ala Leu Asn Asn Phe Val Asp Asp Thr		
385	390	395 400

Ser Tyr Asp Val Met Lys Glu Lys Gly Val Asn Val Ile Pro Tyr Leu
405 410 415

Arg Gln Ser Trp Val Asp Leu Ala Asp Lys Tyr Met Val Glu Ala Arg
420 425 430

Trp Phe Tyr Gly Gly His Lys Pro Ser Leu Glu Glu Tyr Leu Glu Asn
435 440 445

Ser Trp Gln Ser Ile Ser Gly Pro Cys Met Leu Thr His Ile Phe Phe
450 455 460

Arg Val Thr Asp Ser Phe Thr Lys Glu Thr Val Asp Ser Leu Tyr Lys
465 470 475 480

Tyr His Asp Leu Val Arg Trp Ser Ser Phe Val Leu Arg Leu Ala Asp
485 490 495

Asp Leu Gly Thr Ser Val Glu Glu Val Ser Arg Gly Asp Val Pro Lys
500 505 510

Ser Leu Gln Cys Tyr Met Ser Asp Tyr Asn Ala Ser Glu Ala Glu Ala
515 520 525

Arg Lys His Val Lys Trp Leu Ile Ala Glu Val Trp Lys Lys Met Asn
530 535 540

Ala Glu Arg Val Ser